Net-Ready KPP Development

Lesson Objectives

This lesson provides you with a description of the processes used to develop and certify the Net-Ready Key Performance Parameter (NR-KPP) for a Capability Development Document (CDD) and a Capability Production Document (CPD). After completing this lesson you will be able to:

- Recognize the importance of key terms and references required to develop the NR-KPP for the CDD and CPD.
- Recognize what the NR-KPP is used for.
- Explain the three attributes of a NR-KPP and the three-step process for developing their thresholds and objectives.
- Recognize how architecture data products support NR-KPP development.
- Describe the process for certification of the NR-KPP, to include the relationships to the acquisition and JCIDS processes.

Net-Ready KPP Development

Key Terms

Before you start developing a NR-Ready KPP, you need to be familiar with key terms and references. Select each of the following terms for a brief definition.

- **Net-Ready KPP**
- **Net-Centric**
- **Information Exchange**
- **Architecture Data**
- **Solution Architectures**
- **Global Information Grid (GIG)**
- **Interoperability**
- **Information Support Plan (ISP)**
- **Interface Control Agreement**
- **Joint Mission Thread**
- **Joint Information Environment**
- **Certification**

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Net-Ready KPP Development

Important References

The following references will help you develop a NR KPP. They provide details that go beyond this lesson and should be included in your "net-ready" or "interoperability" reference library. Your can find these references linked to DAU's Acquisition Community Connection (Resources tab above), or the NR KPP Wiki site, https://intellipedia.intelink.gov/wiki/Net_Ready_-_Key_Performance_Parameter_(NR-KPP)_Manual (requires CAC).

- JCIDS Manual
- Net-Ready KPP Manual
- DoD Architecture Framework (DODAF)
- DoD Information Enterprise Architecture (DoD IEA)
- DOD Architecture Registry System (DARS)
- Joint Mission Thread (JMT) Users Guide
- Universal Joint Task List (UJTL)
- Interim Guidance for Interoperability of IT and NSS, DoD CIO, 27 Mar 2012

The two most important references are the JCIDS and NR KPP manuals. Always check them for the latest guidance and reference material.

Net-Ready KPP Development

Knowledge Review

The two most important references for developing a Net-Ready KPP are:

a. JCIDS Manual and CJCSI 3179.01 series
b. DOD Architecture Framework and the Universal Joint Task List
c. JCIDS and Net-Ready KPP Manuals

Net-Ready KPP Development

NR-KPP Functions.

The NR-KPP is used to:

- Evaluate interoperability and net-centric requirements for the system.
- Verify the system supports operationally effective producer to consumer information exchanges according to the sponsor's validated requirements and applicable reference models and reference architectures.
- Provide **measures of effectiveness (MOE)** and **measures of performance (MOP)** to evaluate the systems ability to meet the threshold and objective or initial minimum values when testing the system for interoperability certification.
- Analyze and identify potential interoperability issues early in the system's life cycle and identify joint interfaces through systems engineering and architecture development.

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Net-Ready KPP Development

NR-KPP Functions, continued.

The NR-KPP is used to:

- Determine whether the system complies with **Network Operations (NetOps)** for the Global Information Grid (GIG) direction, GIG 2.0 goals and characteristics, and is integrated into system development.
- Ensure compliance with joint, DOD, national, and international spectrum utilization requirements, **Electromagnetic Environment Effects (E3)**, information bandwidth requirements, bandwidth analysis, **tactical data links (TDL),** selective availability anti-spoofing module **(SAASM),** and the joint tactical radio system **(JTRS).**

Net-Ready KPP Development

Knowledge Review

A Net-Ready KPP is used to (select all that apply):

a. Analyze and identify potential interoperability issues
b. Evaluate interoperability and net-centric requirements for a system
c. Ensure the system can operate on the world wide web
d. Ensure compliance with spectrum utilization requirements
e. Determine if the system complies with network operations for the GIG

Net-Ready KPP Development

Knowledge Review

Electromagnetic Environment Effects (E3) are characterized by:

a. The impact of the electromagnetic environment upon the operational capability of military forces, equipment, systems and platforms.
b. Changes in system behavior, capability, or operational environment that is tied to the attainment of an end state, or creation of an effect.
c. Precision time and frequency signals for high bandwidth mission critical communications systems that require the highest security support.

Net-Ready KPP Development

Attributes of a NR KPP

Net-ready attributes determine specific measurable and testable criteria for interoperability, and operationally effective end-to-end information exchanges.

The Net-Ready KPP identifies operational, net-centric requirements with threshold and objective values that determine its MOEs and MOPs.

All communication, computing, and electromagnetic spectrum requirements involving information elements among producer, sender, receiver, and consumer must have a Net-Ready KPP. Information elements include the information, product, and service exchanges. These exchanges enable successful completion of the warfighter's mission or joint business processes*.

*The three Enterprise Architecture (EA) mission areas they may require a NR-KPP are warfighting, business, and intelligence.

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Net-Ready KPP Development

Attributes of a Net-Ready KPP, continued…

A NR-KPP includes three attributes derived through a three step process of mission analysis, information analysis, and systems engineering.

These attributes are then documented in solution architectures developed according to the current DODAF or the **NR-KPP architecture data assessment template**. The attributes depict how planned or operational IT:

- Supports military operations (Attribute 1);
- Is entered and managed on the network (Attribute 2); and,
- Effectively exchanges information (Attribute 3).

On the next series of pages, we will address each of these attributes in detail.

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Net-Ready KPP Development

Net-Ready KPP Attribute Characteristics

Attribute 1. Supports Military Operations

This attribute specifies which military operations a system supports.

MOEs are used to measure mission success and are specific to the conditions under which a mission will be executed. The MOEs are the basis of the NR-KPP threshold and objective measures. This attribute should also specify which operational tasks the IT supports.

The MOPs are used to measure task performance and the conditions under which the tasks are performed.

Since the NR-KPP focuses on exchanging information, products, or services with external IT, these tasks should only be **net-centric operational tasks.**

The NR-KPP will also be used in the Information Support Plan (ISP) to identify support required from external IT.

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Net-Ready KPP Development

Example, Net-Ready KPP Attribute 1. This example illustrates NR-KPP attribute 1, Support to Military Operations.

NR-KPP Attribute	Key Performance Parameter	Threshold	Objective
Support to military operations	Mission: Tracking and locating (Finding, Fixing, Finishing) High-Value Target (HVT) Measure: Timely, actionable dissemination of acquisition data for HVT Conditions: Targeting quality data to the neutralizing/ tracking entity	10 minutes Area denial of HVT activities	Near-real-time HVT tracked, neutralized
	Mission Activities: Find HVT	100 meter	25 meter circle

Net-Ready KPP Development

Net-Ready KPP Attribute Characteristics, continued

Attribute 2. Entered and Be Managed On the Network

This attribute specifies which networks the IT system must connect to in order to support its net-centric military operations. The attribute must also specify performance requirements for these connections.

To determine these performance requirements, answer the following questions in the context of the missions and tasks supported:

(1) What types of networks will the IT system connect to (this is more than internet protocol (IP) networks)?

(2) What MOPs do the required networks use to measure network entrance and management performance? This includes MOPs to measure the time from system start up to when the system is connected to the network and is supporting military operations.

(3) Who manages the IT system as it connects to various networks?

(4) How is the IT system managed? Will management be distributed, centralized, local, or remote?

Net-Ready KPP Development

Example, Net-Ready KPP Attribute 2. This example illustrates NR-KPP attribute 2, Enter and be Managed on the Network.

NR-KPP Attribute	Key Performance Parameter	Threshold	Objective
Enter and be managed in the network	Network: SIPRNET Measure: Time to connect to an operational network from power up Conditions: Network connectivity	2 minutes 99.8	1 minute 99.9
	Network: NIPRNET Measure: Time to connect to an operational network from power up Conditions: Network connectivity	2 minutes 99.8	1 minute 99.9

Net-Ready KPP Development

Net-Ready KPP Attribute Characteristics, continued

Attribute 3. Effectively Exchanges Information.

This attribute specifies the information elements produced and consumed by each mission and net-ready operational task identified above.

Since the NR-KPP focuses on an IT system's interactions with external systems, information elements it produces, sends, or makes available to an external system and information elements it receives from an external system are identified.

For each information element, MOPs are used to measure the information element's production or consumption effectiveness.

The NR-KPP MOPs should also describe the information elements' continuity, survivability, interoperability, security, and operational effectiveness and how unanticipated users are affected.

Net-Ready KPP Development

Example, Net-Ready KPP Attribute 2. This example illustrates NR-KPP attribute 3, Effectively Exchange Information.

NR-KPP Attribute	Key Performance Parameter	Threshold	Objective
Exchange information	Information Element: Target Data Measure: Dissemination of HVT biographic and physical data Measure: Receipt of HVT data Measure: Latency of data Measure: Strength of encryption Conditions:	10 seconds Line of Sight (LOS) 5 seconds NSA certified type 1 Permissive environment	5 seconds Beyond LOS 2 seconds NSA certified type 1 Non-permissive environment

Net-Ready KPP Development

Three-Step NR-Ready KPP Development Process.

The NR-Ready KPP must specify measurable and testable interoperability requirements. The NR-Ready KPP Manual uses the following 3 step question/ answer process to develop threshold and objective values or **initial minimum values** for the three attributes previously described:

Step 1: Mission Analysis determines the IT system's operational requirements in terms of missions, mission tasks, and associated mission effectiveness and operational performance measures;

Step 2: Information Analysis determines the IT system's information requirements in terms of required networks, mission thread information elements, and associated operational performance measures; and

Step 3: Systems Engineering decomposes NR-KPP requirements defined in mission analysis and information analysis into system performance metrics for use during system design. It also demonstrates how the IT system satisfies operational and information requirements.

The next series of pages will expand on the three steps and describe the question/answer approach.

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Net-Ready KPP Development

Three-Step NR-Ready KPP Development Process, continued.

Step 1: Mission Analysis.

Mission analysis identifies the threshold and objective values needed for NR-KPP attribute 1.

This attribute specifies the missions and military operations (e.g. UJTL, **Joint Mission Essential Task Lists (JMETL)**, and JMTs the IT system supports, the effectiveness metrics used to measure success in supporting the identified operations and the conditions under which a mission will be executed.

Mission analysis activities include determining the mission; determining mission tasks; determining essential tasks; identifying organizations, conditions and standards; and determining which operational organizations reviewed and will use resulting information. See the NR-KPP Manual for detailed information on conduct of these analysis activities.

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Net-Ready KPP Development

Three-Step NR-Ready KPP Development Process, continued.

Step 1 continued: Review Mission Analysis.

At the end of the mission analysis the following questions should be answered:

1) What are the mission(s) and the stressing **mission thread(s)** for the system?

2) What are the MOEs for the mission(s)?

3) Who executes tasks during mission thread(s)?

4) What tasks are required to execute the mission thread?

5) What are the MOPs for the mission threads?

6) Under what conditions must the mission threads be executed?

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Net-Ready KPP Development

Three-Step NR-Ready KPP Development Process, continued.

Step 2: Information Analysis.

Information analysis identifies the characteristics needed for the remaining NR-KPP attributes:

- IT system is entered and managed on the network and can effectively exchange information. This step determines the derived operational information requirements in terms of required networks, mission thread information elements, and MOPs.
- Information analysis activities include determining information elements for each mission thread task; determining the different networks required to transport the information elements; determining the entry and management requirements for the networks the IT will connect to; and determining the performance requirements for each of the information elements.

See the NR-KPP Manual for detailed information on conduct of these analysis activities.

Net-Ready KPP Development

Three-Step NR-Ready KPP Development Process, continued.

Step 2 continued. Completing Information Analysis will answer the following questions to ensure IT can be entered and managed on the network and IT effectively exchanges information:

1) What are the data requirements (inputs and outputs) from each operational activity or task?
2) What are the sending and receiving nodes for all information elements produced or consumed by the operational tasks?
3) What is the structure of the information elements produced or consumed by the operational tasks?
4) What are the performance requirements for the information elements defined for the operational tasks?
5) What networks will the system use to exchange the information and how will the system enter and be managed in those networks?

Net-Ready KPP Development

Three-Step NR-Ready KPP Development Process, continued.

Step 3: Systems Engineering. This step should be completed by the acquisition program office. Systems engineering focuses on ensuring the IT meets the attribute threshold and objective values.

The following sequence is used to develop system performance technical requirements. Select each for a brief description. See the NR-KPP Manual for details, and what architectural data products from the DoDAF are used to record the information:

- **Systems Functionality**
- **System Data Exchanges**
- **Function Performance**
- **System Data Exchange Performance**
- **Physical Connections**
- **Logical Connections**
- **Data Structure**
- **Standards**

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Net-Ready KPP Development

Knowledge Review

The three attributes of a Net-Ready KPP are:

a. Mission analysis, information analysis and systems engineering
b. Supports military operations, is entered and managed on the network, and effectively exchanges information
c. Provides MOE's and MOPs to measure mission success, conducts net-centric operational tasks, and clearly specifies what networks the IT system must connect to.

Net-Ready KPP Development

Knowledge Review

The term “Initial Minimum Values” refers to:

a. Thresholds and objectives derived from the Net-Ready KPPs Measures of Performance.
b. Systems engineering performance metrics used to design an IT system.
c. Metrics used for the “IT Box” model instead of threshold and objectives.

Net-Ready KPP Development

Architecture data products that support NR-KPP development.

Architecture development enables development of the NR-KPP. Architecture-based solutions are fundamental for improved interoperability, better information sharing, stricter compliance, and leaner processes. They also feed into system engineering processes and ultimately result in reduced costs and more effective mission accomplishment.

Architecture data must be submitted in **formats** support staffing, analysis, distribution, and reuse. The architecture views must be submitted in formats that can be viewed without specialized or proprietary tools and they must be legible for reviewers.

A detailed list of required data for each NR-KPP architecture view is provided in the NR-KPP Manual, enclosure G.

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Net-Ready KPP Development

Architecture data products that support NR-KPP development.

What architecture data is required?

DODAF described architecture models, or “viewpoints”, are currently listed and defined in DODAF version 2.02. Always ensure you are using the current version of the DoDAF by accessing the DoD Chief Information Officer’s web site, http://dodcio.defense.gov/

The DODAF does not prescribe “mandatory” architecture viewpoints. It provides information upon which process owners can base a decision on what viewpoints are needed.

The DoDAF-described viewpoints that are required for JCIDS documents are specified in the JCIDS Manual, enclosure B, Table B-F-3. This table specifies which viewpoints are the responsibility of the JCIDS document sponsor, the acquisition program office, and those that are the joint responsibility of the sponsor and program offices.

Net-Ready KPP Development

Architecture data products that support NR-KPP development, continued…
Selected DODAF-described viewpoints are required by the JCIDS Manual to support NR-KPP development and certification. These viewpoints include:

- **All Viewpoint (AV)** – 2 viewpoints
- **Capability Viewpoint (CV)** – 7 viewpoints
- **Data and Information Viewpoint (DIV)** – 3 viewpoints
- **Operational Viewpoint (OV)** – 9 viewpoints
- **Project Viewpoint (PV)** – 3 viewpoints
- **Services Viewpoint (SvcV)** – 4 viewpoints
- **Standard Viewpoint (StdV)** – 13 viewpoints
- **Systems Viewpoint (SV)** – 13 viewpoints

Detailed descriptions of each of the 54 viewpoints are in the DODAF. Currently, the JCIDS Manual requires 31 to support NR-KPP certification. For a summary-level description select each.

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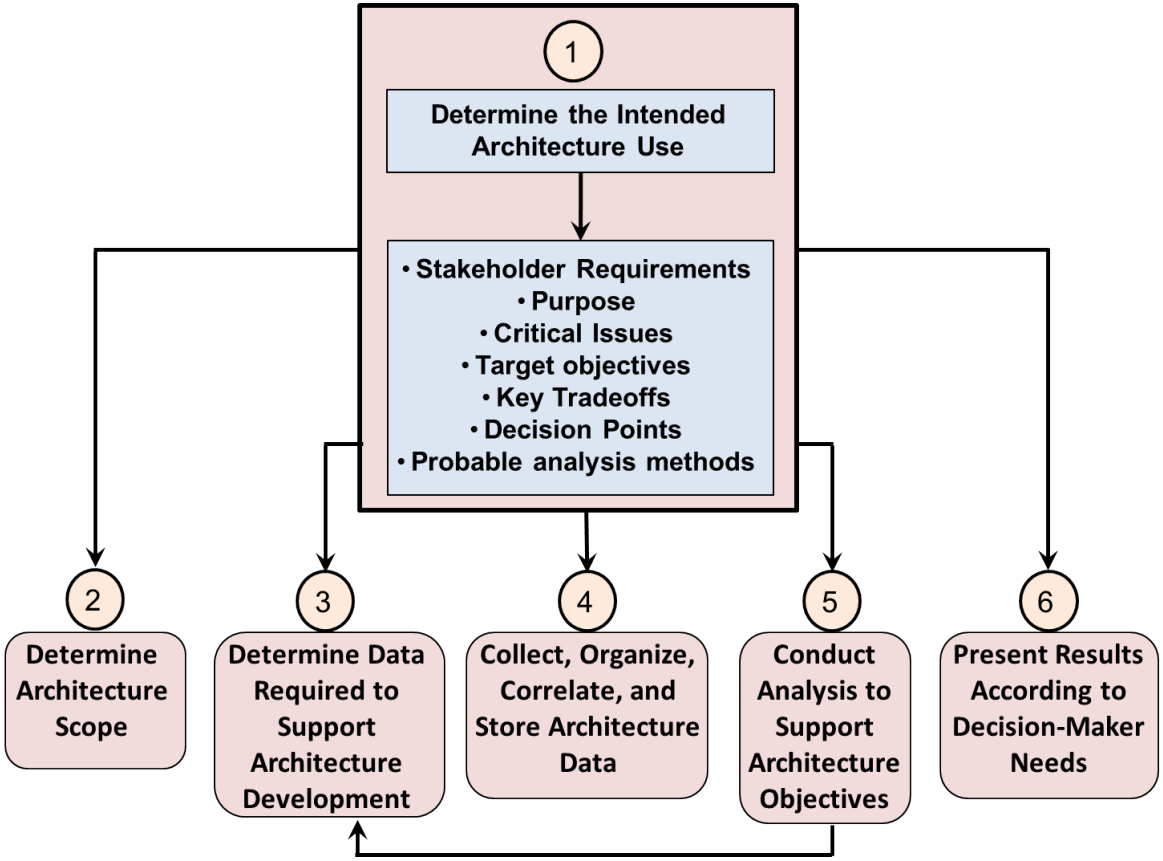
Net-Ready KPP Development

DODAF 6-Step Process for Developing Architecture Data

The DODAF describes a 6-step architecture development process for DOD. The 6-step architecture development process supports the 3-step NR-KPP development process described earlier. The figure below describes this process.



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Select steps 2 – 6 for more detail

Net-Ready KPP Development

Architecture Data Required for JCIDS documents. This chart, and the next two pages provide an indication of the workload required for architecture data development. Remember, a detailed list of required data for each NR-KPP architecture view is provided in the NR-KPP Manual, enclosure G.

- **All View (AV):**
  - AV-1, Overview & Summary
  - AV-2, Dictionary of Terms
- **Capability View (CV)**
  - CV-1, Vision
  - CV-2, Capability Taxonomy
  - CV-3, Capability Phasing
  - CV-4, Capability Dependencies
  - CV-5, Capability to Organizational Development Mapping
  - CV-6, Capability to Operational Activities Mapping
- **Data & Information View (DIV)**
  - DIV-1, Conceptual Data Model
  - DIV-2, Logical Data Model

	ICD	CDD	CPD
AV-1	X	X	X
AV-2	X	X	X
CV-1	*R*	X	X
CV-2	X	X	X
CV-3	*R*	X	X
CV-4	*R*	X	X
CV-5		X	X
CV-6	X	X	X
DIV-2		X	X
DIV-3		X	X

R = Recommended

JCIDS Sponsor Responsibility

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Joint Program/Sponsor Responsibility

Net-Ready KPP Development

Architecture Data Required for JCIDS documents, continued..

- **Operational View (OV):**
  - OV-1, High-level Operational Concept Graphic
  - OV-2, Operational Resource Flow Description
  - OV-3, Operational Resource Flow Matrix
  - OV-4, Organizational Relationships Chart
  - OV-5a, Operational Activity Decomposition Tree
  - OV-5b, Operational Activity Model
  - OV-6a, Operational Rules Model
  - OV-6c, Event-Trace Description
- **Project View (PV)**
  - PV-2, Project Timelines

	ICD	CDD	CPD
OV-1	X	X	X
OV-2	X	X	X
OV-3		X	X
OV-4	X	X	X
OV-5a		X	X
OV-5b	*O*	X	X
OV-6a		X	X
OV-6c	X	X	X
PV-2		X	

O = Optional

Program Responsibility **JCIDS Sponsor Responsibility**

Net-Ready KPP Development

Architecture Data Required for JCIDS documents, continued..

- **Systems View (SV):**
  - SV-1, Systems Interface Description
  - SV-2, Systems Resource Flow Description
  - SV-3, Systems-Systems Matrix
  - SV-4, Systems Functionally Description
  - SV-5a, Operational Activity to Systems Function Traceability Matrix
  - SV-6, Systems Resource Flow Matrix
  - SV-7, Systems Measures Matrix
- **Services View (SvcV)**
  - SvcV-1, Services Context Description
  - SvcV-2, Services Resources Flow Description
  - SvcV-4, Services Functionality Description
  - SvcV-5, Operational Activity to Services Traceability Matrix
  - SvcV-6, Services Resource Flow Matrix
  - SvcV-7, Services Measures Matrix
- **Standards View (StdV)**
  - StdV-1, Standards Profile

	ICD	CDD	CPD
SV-1 or SvcV-1	X	X	X
SV-2 or SvcV-2	X	X	X
SV-4 or SvcV-4		X	X
SV-5a or SvcV-5	X	X	X
SV-6 or SvcV-	X	X	X
SV-7 or	*R*	X	X
StdV-1 (TV-1)		X	X
StdV-2 (TV-1)		X	X

R = Recommended

Program Responsibi **Joint Program/Sponsor Responsibilit**

JCIDS Sponsor Responsibility

Net-Ready KPP Development

Knowledge Review

True or False: All of the architecture data “views” described in the DoD Architecture Framework (DODAF) must be used to support development of the Net-Ready KPP.

a. True
b. False

Net-Ready KPP Development

Knowledge Review

The Operational Views (OV) described by the DOD Architecture Framework reflect:

a. Capability requirements, delivery timing, and deployed capability.
b. Relationships between operational and capability requirements.
c. Operational scenarios, activities and requirements that support capabilities.

Net-Ready KPP Development

Certification of the NR-KPP

CJCSI 6212.01 series and the NR-KPP Manual describe the process NR-KPP certifications. There are two types of certifications, document and test:

Document certification. Provided by Joint Staff memo prior to Milestones B and C. Joint Staff conducts a review of the CDD and CPD with the supporting DODAF architecture data or the optional NR KPP Architecture Data Assessment Template, and reviews the **DD Form 1494**.

The four NR-KPP certifications are:

- Certified. Completed all NR KPP requirements and all comments were successfully adjudicated.
- Not Certified. Completed all NR KPP requirements, but has unresolved critical comments that deny certification.
- Not Applicable. The Joint Staff determines the NR-KPP does not apply because it lacks joint interface or doesn't exchange information.
- Not Required. The Joint Staff determines that NR-KPP certification is not required by regulation or other guidance.

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Test certification is covered next.

Net-Ready KPP Development

Certification of the NR-KPP, continued..

Test Certification policy for the NR-KPP is the responsibility of the DoD Chief Information Officer (CIO). The test certification process is governed by CIO policy, and conducted by the **Joint Interoperability Test Command (JITC)**.

JITC will leverage previous, planned and executed Development Test and Evaluation (DT&E) and Operational Test and Evaluation (OT&E) tests and results to support joint interoperability test certification and eliminate test duplication.

The JITC test certification document is due prior to the Full Rate Production Decision Review, or Full Deployment Review (FRPDR/FD) for software intensive systems.

JITC certification is valid for four years from the date of the certification or when subsequent program modifications change components of the NR KPP or supportability aspects of the system

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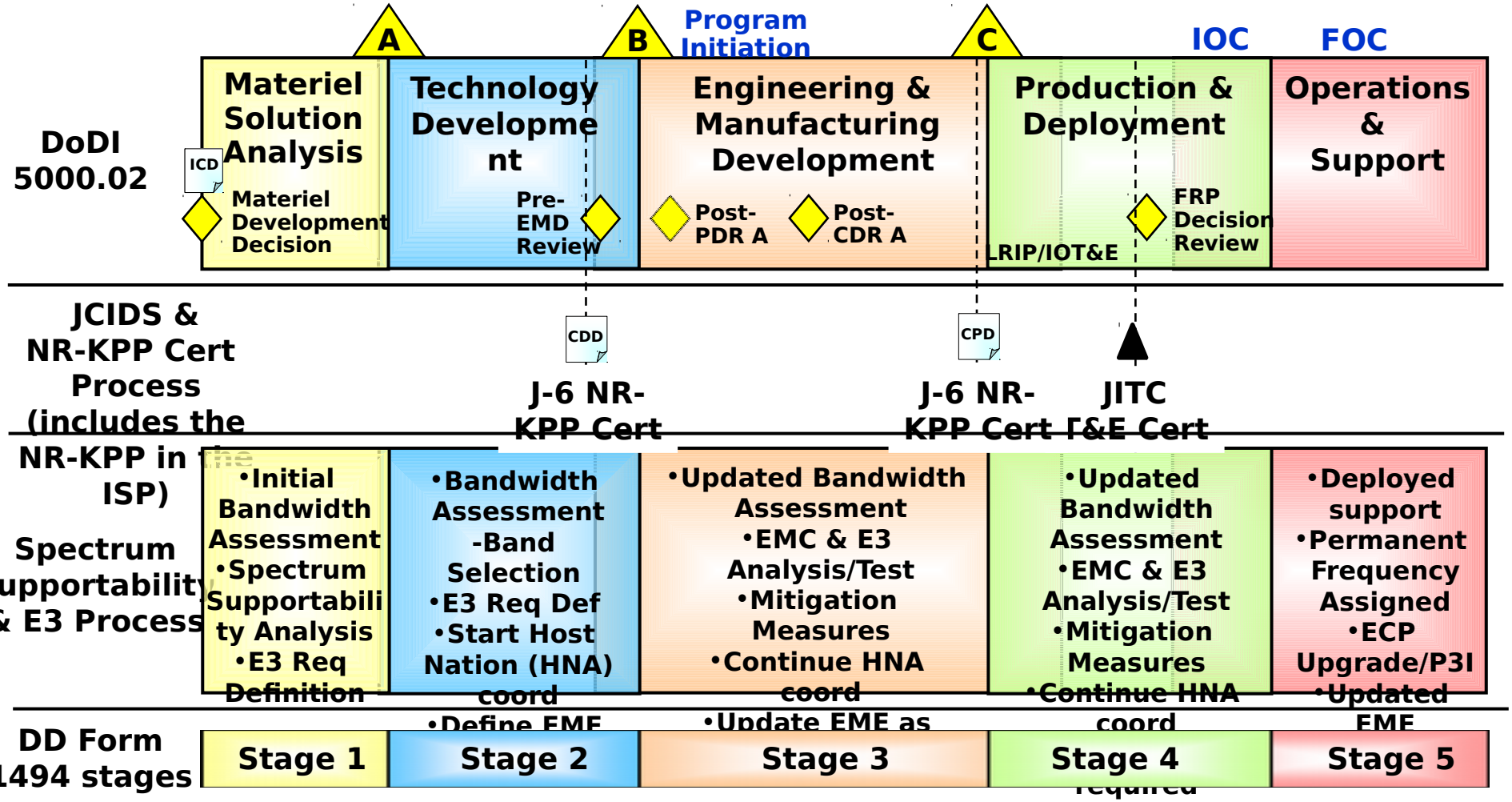
Net-Ready KPP Development

NR-KPP Certification Process Relationships.

This chart illustrates the acquisition, JCIDS, NR-KPP certification, ISP and spectrum compliance relationships. It is important to understand this.



DD Form 1494 stages are explained in the NR-KPP Manual, encl B

Net-Ready KPP Development

Knowledge Review

The Joint Interoperability Test Command's activities for certification of the Net-Ready KPP include:

a. Certifying that the CDD and CPD reflect completion of all Net-Ready KPP documentation requirements.
b. Leveraging previous, planned and executed Development and Operational tests to eliminate testing duplication.
c. Conduct of mandatory stand-alone testing prior to the commitment to production at Milestone C.

Net-Ready KPP Development

Knowledge Review

The Joint Staff certifies the Net-Ready KPP in which of the following documents:

a. The CDD and CPD.
b. The ICD, CDD and CPD
c. The CDD, CPD and ISP

Net-Ready KPP Development

Lesson Summary

Now that you have completed the NR-KPP lesson you should be able to describe the processes used to develop and certify the Net-Ready Key Performance Parameter (NR-KPP) for a Capability Development Document (CDD) and a Capability Production Document (CPD). Specifically you should be able to:

- Recognize the importance of key terms and references required to develop the NR-KPP for the CDD and CPD.
- Recognize what the NR-KPP is used for.
- Explain the three attributes of a NR-KPP and the three-step process for developing their thresholds and objectives.
- Recognize how architecture data products support NR-KPP development.
- Describe the process for certification of the NR-KPP, to include the relationships to the acquisition and JCIDS processes.